WHAT IS CLAIMED IS:

1. A method for regulating the flow of potassium through potassium channels in an individual in need thereof which comprises administering a therapeutically effective amount of a κM conopeptide.

2. The method of claim 1, wherein said individual in need thereof suffers from a disorder selected from the group consisting of multiple sclerosis, other demyelinating diseases (such as acute dissenmiated encephalomyelitis, optic neuromyelitis, adrenoleukodystrophy, acute transverse myelitis, progressive multifocal leukoencephalopathy), sub-acute sclerosing panencephalomyelitis (SSPE), metachromatic leukodystrophy, Pelizaeus-Merzbacher disease, spinal cord injury, botulinum toxin poisoning, Huntington's chorea, compression and entrapment neurophathies (such as carpal tunnel syndrome, ulnar nerve palsy), cardiovascular disorders (such as cardiac arrhythmias, congestive heart failure), reactive gliosis, hyperglycemia, immunosuppression, cocaine addiction, cancer, cognitive dysfunction, disorders resulting from defects in neurotransmitter release (such as Eaton-Lambert syndrome), and reversal of the actions of curare and other neuromuscular blocking drugs.

3. The method of claim 1, wherein said disorder is a demyelinating disease.

4. The method of claim 1, wherein said κM conopeptide is selected from the group consisting of:

(i) a peptide having the general formual Leu-X1-Ser-Cys-Cys-Ser-Leu-Asn-Leu-Arg-Leu-Cys-X1-Val-X1-Ala-Cys-Lys-Arg-Asn-X1-Cys-Cys-Thr (SEQ ID NO:1), wherein X1 is Pro or hydroxy-Pro and the C-terminus is amidated or a free carboxyl and

(ii) a derivative of the peptide of (i).

5. The method of claim 4, wherein said individual in need thereof suffers from a disorder selected from the group consisting of multiple sclerosis, other demyelinating diseases (such

as acute dissenmiated encephalomyelitis, optic neuromyelitis, adrenoleukodystrophy, acute transverse myelitis, progressive multifocal leukoencephalopathy), sub-acute sclerosing panencephalomyelitis (SSPE), metachromatic leukodystrophy, Pelizaeus-Merzbacher disease, spinal cord injury, botulinum toxin poisoning, Huntington's chorea, compression and entrapment neurophathies (such as carpal tunnel syndrome, ulnar nerve palsy), cardiovascular disorders (such as cardiac arrhythmias, congestive heart failure), reactive gliosis, hyperglycemia, immunosuppression, cocaine addiction, cancer, cognitive dysfunction, disorders resulting from defects in neurotransmitter release (such as Eaton-Lambert syndrome), and reversal of the actions of curare and other neuromuscular blocking drugs.

6. The method of claim 4, wherein said disorder is a demyelinating disease.

7. The method of claim 4, wherein X1 is hydroxy-Pro

8. The method of claim 7, wherein said individual in need thereof suffers from a disorder selected from the group consisting of multiple sclerosis, other demyelinating diseases (such as acute dissenmiated encephalomyelitis, optic neuromyelitis, adrenoleukodystrophy, acute transverse myelitis, progressive multifocal leukoencephalopathy), sub-acute sclerosing panencephalomyelitis (SSPE), metachromatic leukodystrophy, Pelizaeus-Merzbacher disease, spinal cord injury, botulinum toxin poisoning, Huntington's chorea, compression and entrapment neurophathies (such as carpal tunnel syndrome, ulnar nerve palsy), cardiovascular disorders (such as cardiac arrhythmias, congestive heart failure), reactive gliosis, hyperglycemia, immunosuppression, cocaine addiction, cancer, cognitive dysfunction, disorders resulting from defects in neurotransmitter release (such as Eaton-Lambert syndrome), and reversal of the actions of curare and other neuromuscular blocking drugs.

9. The method of claim 7, wherein said disorder is a demyelinating disease.

10. The method of claim 4, wherein said derivative is the peptide in which the Arg residues may be substituted by Lys, ornithine, homoargine, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys, N,N,N-trimethyl-Lys or any synthetic basic amino acid; the Lys residues may be substituted by Arg, ornithine, homoargine, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys, N,N,N-trimethyl-Lys or any synthetic basic amino acid; the Ser residues may be substituted with Thr or any synthetic hydroxylated amino acid; the Thr residues may be substituted with Ser or any synthetic hydroxylated amino acid; the Asn, Ser, Thr or Hyp residues may be glycosylated; the aliphatic amino acids may be substituted by synthetic derivatives bearing non-natural aliphatic branched or linear side chains C_nH_{2n+2} up to and including n=8; the Leu residues may be substituted with Leu (D); and the Asn residues may be substituted with Gln.

11. The method of claim 10, wherein said individual in need thereof suffers from a disorder selected from the group consisting of multiple sclerosis, other demyelinating diseases (such as acute dissenmiated encephalomyelitis, optic neuromyelitis, adrenoleukodystrophy, acute transverse myelitis, progressive multifocal leukoencephalopathy), sub-acute sclerosing panencephalomyelitis (SSPE), metachromatic leukodystrophy, Pelizaeus-Merzbacher disease, spinal cord injury, botulinum toxin poisoning, Huntington's chorea, compression and entrapment neurophathies (such as carpal tunnel syndrome, ulnar nerve palsy), cardiovascular disorders (such as cardiac arrhythmias, congestive heart failure), reactive gliosis, hyperglycemia, immunosuppression, cocaine addiction, cancer, cognitive dysfunction, disorders resulting from defects in neurotransmitter release (such as Eaton-Lambert syndrome), and reversal of the actions of curare and other neuromuscular blocking drugs.

12. The method of claim 10, wherein said disorder is a demyelinating disease.